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STATEMENT

Subject: dissertation for the award of the educational and scientific degree "Doctor" on the topic "THE IMPACT OF REGULATION (EU) 2019/881 (CYBERSECURITY ACT) ON THE EXPANSION OF CYBERSECURITY CERTIFICATIONS", field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6. Informatics and Computer Science (Information Systems and Technologies, Informatics and Computer Science)

Author: RACHELI MENDA SHABAT

Scientific supervisors: Assoc. Prof. Galina Mileva, PhD and Assoc. Prof. Zlatogor Minchev, PhD

Relevance of the dissertation

In the era of Industry 4.0 and the mass penetration of IoT devices, cybersecurity is becoming a critical factor for trust in the EU's digital single market. Rahel Shabat's dissertation addresses a fundamental problem: how to undermine the certification of billions of devices without compromising quality. The research is extremely relevant, as it analyzes the role of private conformity assessment bodies (CABs) in the context of the EU Cybersecurity Act, which is directly related to the upcoming full implementation of the Cyber Resilience Act (2026-2027).

Presentation and structure of the research

The dissertation demonstrates a high degree of interdisciplinarity, combining normative analysis with advanced mathematical models.

Chapter One: Analysis of the regulatory environment and legitimacy

This provides a theoretical basis for the research. The author conducts a systematic review of standards such as ISO/IEC 27001, 15408 and 19790. The main contribution here is the detailed distinction between:

● Environmental Security: Focus on the lifecycle and development environment (ISMS) and

● Functional Security: Focus on the built-in protection mechanisms of your product.

Legitimacy theory is successfully applied to argue why the transition to private certification systems requires new levels of transparency and shared responsibility between the state and business.

Chapter Two: Methodological Framework and Model for Micro-Macro Adaptation

This chapter is the core of the scientific novelty of the work. The author develops an integrated model for the success of private schemes using a set of decision-support methods:

● House of Quality (HoQ): Used to transform abstract EU legal requirements into concrete technical development parameters;

● Fuzzy Analytic Hierarchy Process (Fuzzy AHP): This is the strongest mathematical part of the work. The use of "fuzzy" sets allows the model to handle subjective and uncertain data when choosing a certification body. The model calculates weighting criteria such as expertise, neutrality and market influence;

● Prognostic modeling: The PSF (for predicting market acceptance) and PSS (for selecting an assessment body) models are presented, which provide managers and engineers with a practical algorithm for action.

Chapter Three: Validation through application scenarios

In the third chapter, the models are proposed to be stress-tested through three fundamentally different industrial applications:

1. Hardware components (Flash Memory): Analysis of protection against physical penetration.

2. Energy (Smart Grid Hub): Research on the resilience of critical network infrastructures.

3. Consumer electronics (IP camera): Modeling of personal data protection in the mass segment. The results of the approbation have convincingly proven that the combination of the author's methodology leads to the identification of a larger number of vulnerabilities at an early stage and more effective implementation of protective measures.

Scientific and applied contributions

● An original model for assessing the credibility of private schemes in cybersecurity has been created.

● An algorithmic model has been developed to assist IoT manufacturers in selecting a CAB.

● A strategy for harmonizing private and public schemes within the EU has been proposed.

Publications on the dissertation

One publication for print in the publication Lecture Notes in Networks and Systems, an article in the proceedings of the Second International Conference on Advanced Computing and Systems, June 26-27, 2025, Kolkata, India, has been submitted for the dissertation. LNNS is indexed in Scopus and has an SJR of 0.166 (2024). This satisfies the minimum national requirements of 30 points for obtaining an ONS doctorate. A list of conferences in conferences without subsequent publication of the participation of the materials presented by the doctoral student is also attached.

The abstract presents in a brief form the main points of the dissertation research.

Conclusion

The submitted dissertation for the award of the scientific degree "Doctor" in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6. Informatics and Computer Sciences (Information Systems and Technologies, Informatics and Computer Sciences), is a fully completed work containing scientific-applied and applied results that are an original contribution to science. It shows that the doctoral student possesses the necessary theoretical and practical knowledge in the scientific specialty and is capable of independent scientific research. The dissertation meets the requirements of the ZRASRB and the Regulations for the Implementation of the ZRASRB.

I give a positive assessment of the presented dissertation work " THE IMPACT OF REGULATION (EU) 2019/881 (CYBERSECURITY ACT) ON THE EXPANSION OF CYBERSECURITY CERTIFICATIONS " with author RACHELI MENDA SHABAT.

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